January 30, 1851.

SIR RODERICK IMPEY MURCHISON, V.P., in the Chair.

The following papers were read:—

1. "On the Oxidation of Ammonia in the Human Body, with some remarks on Nitrification." By Henry Bence Jones, M.D., F.R.S. &c. Received December 18, 1850.

The author having shown, in a paper lately communicated to the Royal Society, that the effect of tartrate of ammonia on the acidity of the urine was totally different from that of tartrate of potash, and that carbonate of ammonia, taken in very large quantities, did not produce any alkaline reaction of the urine, but that, on the contrary, the acidity was rather increased than diminished by such doses, repeated the experiments with carbonate of ammonia, hoping to obtain more decided results. Although, from these experiments, it was again apparent that no diminution of the acid reaction resulted from taking carbonate of ammonia, yet the fact of any great increase in the acidity of the urine could not be determined. In his former paper, the author suggested that an inquiry into the occurrence of nitric acid in the urine would probably give the solution of this unexpected effect of carbonate of ammonia; and he was led to undertake the experiments described in the present paper with the view of detecting the presence of that acid under particular circumstances.

The indigo test for nitric acid being more delicate than the protosulphate of iron test, it was chiefly employed; but a mixture of starch with a drop or two of hydriodate of potash and hydrochloric acid was found to be a far more delicate test than either. Beginning with 10 grs. of nitrate of potash added to 10 oz. of urine, it was found at last that as little as 1 gr. of nitre to 10 oz. of urine could be detected with the greatest certainty and clearness when the starch test was used; but this quantity could not be detected as surely by the indigo test.

Experiments are described in which carbonate of ammonia was given, in doses varying from 40 grs. to 7 grs., to a healthy man in whose urine no nitric acid could previously be detected; and the urine was tested at intervals of several hours after each dose. From these it appears that 10 grs. was the smallest quantity that gave decided evidence of nitric acid by both tests.

Having satisfied himself that when carbonate of ammonia was taken small quantities of nitric acid passed off in the urine, the author made similar experiments with tartrate of ammonia, administered in doses of 60 and 40 grs.; and in each case the starch test gave evidence of the presence of nitric acid in the urine some hours after. Similar experiments with the muriate of ammonia are next described; and in these the presence of nitric acid in the urine was readily detected three hours after the administration of the dose, even when it was so small as 10 grs.

From an experiment described in the paper, it was shown, that by

a simple combustion of ammonia out of the body, as well as in the body, nitric acid was produced. From other experiments it appears that urea, also, by oxidation, whether in the body or out of the body, gives rise to nitric acid.

Having found that nitric acid was produced more readily and frequently than had been supposed to be the case, the author was led to try whether combustions in the atmosphere without ammonia could not give nitric acid. The presence of this acid was, in consequence, detected in the products of the combustion of alcohol, of coal, of a wax candle, and of hydrogen.

As this led to the supposition that nitric acid might exist in rain-water at all times, experiments were made on the rain-water collected on wet days in London, and the presence of nitric acid was discovered by the starch and also by the indigo test.

The conclusions the author comes to from his experiments are:—

1. That the action of oxygen takes place in the body, not only on hydrogen, carbon, sulphur and phosphorus, but also on nitrogen.

2. That in all cases of combustion, out of the body and in the body, if ammonia be present, it will be converted partly into nitric acid.

3. That the nitrogen of the air is not indifferent in ordinary cases of combustion, but that it gives rise to minute quantities of nitric acid.

He further remarks, that the production of nitric acid from ammonia in the body adds another to the many instances of the action of oxygen in man; and that the detection of nitric acid in the urine may lead to the conclusion, that the blood is being freed from ammonia, or from substances closely related to it, as urea, or possibly caffein and other alkaloids.

2. "Description of a Muscle of the striped variety, situated at the posterior part of the choroid coat of the Eye in Mammals, with an explanation of its mode of action in adapting the Eye to distinct vision at different distances." By George Rainey, Esq., M.R.C.S. Communicated by Joseph H. Green, Esq., F.R.S. Received December 24, 1850.

Respecting this muscle, the author observes that it occupies about the posterior two-thirds of the choroid coat, its fibres lying in different planes, the most superficial being immediately beneath the membrana pigmenti, the deepest extending almost as far as the vasa vorticosa; that these fibres pass in different directions, some going from before to behind, and others intersecting these at various angles: altogether they receive the pigment membrane, the retina and the vitreous humour as into a cup.

From the connection of these fibres with the choroid coat, the author calls them the choroid muscle. He has not been able to trace them nearer to the ciliary ligament than about two-thirds of the distance from the centre of the choroid to the border of the cornea, in which situation the fasciculi become broken up, and gradually degenerate into filamentous tissue. No striped fibres can be detected in the so-called ciliary muscle or ligament. These the author